E AGRICULTURAL ECONOMY OF THE BELGIAN CONGO AND RUANDA-URUNDI

ERS - FOREIGN 22
MARCH 1962

Economic Research Service
U.S. Department of Agriculture

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The Belgian Congo was the official name of the country at the time this bulletin was first issued in June 1960. It is now known (1962) as the Republic of the Congo (with capital at Leopoldville). Ruanda-Urundi remains a separate political entity.

Effective April 3, 1961, the responsibility for the work in the Regional Analysis Division was transferred from the Foreign Agricultural Service to the Economic Research Service. This report, originally issued as FAS M-88, is now reissued, without change in text, by the new agency.

THE AGRICULTURAL ECONOMY OF THE BELGIAN CONGO AND RUANDA-URUNDI

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Introduction and Summary

The Belgian Congo--Belgium's only colony--has been in colonial status since 1908. Ruanda-Urundi, formerly a part of German East Africa, was made a League of Nations mandate under Belgian administration following World War I. This general arrangement was continued when the mandate was converted to a United Nations Trusteeship after World War II.

The Belgian Congo, located in central Africa, lies on both sides of the Equator. Its area is roughly equivalent to that part of the United States east of the Mississippi River. All of Ruanda-Urundi is south of the Equator. It is about half the size of Tennessee, and is thickly populated.

Most of the population depends on agriculture for a living. Agriculture also contributes a large part of total exports, though nonfarm products, particularly minerals, usually bring in more foreign exchange than do farm products.

Tree crops for export form a dominant part of the agricultural economy. These include coffee, palm oil and kernels, rubber, cocoa, tea, table bananas, and cinchona. In addition to palm produce, such oil-bearing crops as cotton-seed, peanuts, sesame, and soybeans are grown. Other important export crops include lint cotton, cassava flour, urena and punga, pyrethrum, castor oil, sisal, and essential oils.

Domestic food crops are generally adequate to avert hunger. However, in common with the rest of tropical Africa, diets are heavy in carbohydrates and short in proteins.

As for the livestock industry, it is making progress toward becoming an economic activity, although most cattle in Ruanda-Urundi and many in the Belgian Congo are still kept for tribal prestige, not for profit.

Under the leadership of Belgian administrators, farm produce of the area is carefully processed and graded so that it meets with approval in world markets. The United States is a good customer for the area's farm products, taking $42 million worth of coffee, palm kernel oil, rubber, palm oil, and other agricultural products in 1958, the last year for which trade figures for the area are available. In that year the Belgian Congo and Ruanda-Urundi imported $6.6 million worth of U. S. wheat flour, unmanufactured tobacco,

malt, and other agricultural products.

INEAC, the Congo agricultural research institute, has achieved worldwide recognition in its field. The Congo's paysannat system for settling African farmers has been generally successful and has become well known.

A major problem for agriculture is the difficulty and high cost of transportation. The Congo River is the main freight artery but rapids make it unusable for long stretches. There is no countrywide railroad network. The road system is also inadequate.

In political matters, the Belgian administration has followed a conservative course. Only in the late 1950's was voting permitted by either Europeans or Africans, and then only in municipal elections. When research for this bulletin was started, independence for the Belgian Congo was a faint dream, possibly attainable in 25 or 50 years. The surge toward independence reached the Belgian Congo in full force in 1959, and independence is now scheduled for June 30, 1960. The political future of Ruanda-Urundi is a different story. Self-rule has been promised, but the exact date has not been set. Meanwhile, here is a study of the agricultural economy of the Belgian Congo and Ruanda-Urundi as it appeared in late 1959 and early 1960.

Physical Geography

Few, of any, countries of the world are as closely bound up with one river system as is the Belgian Congo with the Congo River. The colony takes its name from the river, is drained by it, and finds in the river its chief artery of transportation. Practically all of the Belgian Congo is within the Congo River watershed.

Most of Ruanda-Urundi, on the other hand, drains into the headwaters of the Nile, as does a narrow strip of the eastern Belgian Congo north of Ruanda-Urundi. A corner of the Belgian Congo far to the west drains directly into the Atlantic Ocean.

The large area of the Belgian Congo and Ruanda-Urundi and the wide range of altitudes and climates make possible the growing of a variety of crops suited to both temperate and tropical zones.

Location and Size.

The Belgian Congo is located in the heart of Africa. About one-third of the colony is north of the Equator; the remainder is south. Except for a 25-mile coastline on the Atlantic Ocean, the Belgian Congo is entirely surrounded by land. With an area of 909,254 square miles, it is about the size of the United States east of the Mississippi.

Ruanda-Urundi adjoins the Belgian Congo to the east. All of the territory is south of the Equator. Its area of 20,916 square miles is about half that of the State of Tennessee.

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Topography.

The Belgian Congo coincides almost exactly with the drainage basin of the Congo River. A great part of the colony consists of the flat, low-lying Central Basin. Higher land rises to the north, east, and south. In the east, the land rises still further to mountains 16,000 feet and higher.

Ruanda-Urundi is a highland territory; altitudes range from 2,500 feet on Lake Tanganyika to over 8,000 feet in the mountains.

Climate.

The Congo climate is very hot and humid in the low-lying central and western areas. There are frequent, torrential rains. The eastern highlands are temperate and considered rather healthful for Europeans. With this variety in climate, coffee, cotton, and other crops are ripening every month of the year in one part or another of the colony.

Ruanda-Urundi also has hot weather in the lower altitudes and is pleasantly cooler in the higher altitudes. While similar in climate to the eastern Congo, the rainfall is lighter; in fact, there are long dry seasons.

Soils.

The soils of the Belgian Congo and Ruanda-Urundi as a rule are not very fertile. Exceptions to this rule include some soils in Kivu Province, which are of volcanic origin and are deep and rich.

In general, the soils may be divided into three broad associations:

1. Latasols (red or reddish brown to yellowish brown) cover about 85 percent of the area. They have a high proportion of clay. While highly leached and low in plant nutrients, these soils have a good granular structure and friable consistency, and thus drain well and are easily cultivated.

When found on plains and hills, the Latasols and associated soils are reasonably well suited for growing annual crops and tree crops. Some Latasols are also found on mountains and hills that are too steep for farming.

2. Regosols (sands) occur in the southern part of the Congo on nearly level plateaus, deeply cut by streams. In places these sands are 100 to 200 feet deep, are low in fertility, and hold water poorly. They are not of much use for farming.

3. Humic Gley soils occupy swamps and marshes, mainly in the northwest along the Congo and Ubangi Rivers but also in small areas in the southeast. Since these soils are flooded, they are not usable for farming.

Population

As of December 31, 1956, population was reported as follows:

Africa	12,843,574	
Non-African	107,413	
Belgian Congo	12,950,987	
African	4,484,591	
Non-African	9,944	
Ruanda-Urundi	4,494,535	
Grand total, Belgian Congo and Ruanda-Urundi		17,445,522

The Belgian Congo is rather thinly populated, with an average of 14 persons per square mile. Ruanda-Urundi's average population density of 215 persons per square mile is quite high for an African economy based on agriculture.

About 85 percent of the gainfully employed in the Belgian Congo in 1952 were engaged in agriculture, according to the International Labor Office, and the proportion was probably as high or higher in Ruanda-Urundi. More than half of the 85 percent were women, who traditionally do most of the cultivating and harvesting on African farms. Men, whose work on these farms is generally confined to clearing the land and harvesting tree crops, perform all types of field work and harvesting on plantations run by Europeans.

Agricultural Patterns and Policies

Land Use.

When the last figures on land use were published for the area in 1956, only about 1.2 percent of the total land in the Belgian Congo was devoted to annual field crops and tree crops (bearing and nonbearing). About 1 percent was in permanent pasture and about 49 percent in forests. Much of the remainder was in swamps, sand, and mountains. Even so, there was considerable additional land (including that in forests) which could be used for crops and permanent pasture.

In Ruanda-Urundi, about 26 percent of the land was in field and tree crops, about 34 percent in permanent pastures, 6.6 percent in forests, and 33 percent in other land. Since a good deal of Ruanda-Urundi is mountainous, it can be seen that suitable land was being fully used for crops and pasture.

Shifting Cultivation.--As in most of tropical Africa, the soil of the Belgian Congo has been used mainly on a shifting cultivation basis. Native Africans clear a patch of land in the forest or savanna, and plant it to subsistence food crops, such as cassava, corn, sweetpotatoes, and yams. After its fertility drops, they allow the land to grow up in bush or forest, and move on to other forest or savanna land.

Early attempts to clear large tracts of land to be used in the same way as in the United States or Western Europe proved unsuitable, as the tropical sun and the torrents of rain soon leached the nutrients from the soil. As a result, scientific use of the land has required adaptation of the traditionally good, although primitive, methods of the native African.

These adaptations are known as the corridor system (culture en couloirs) in the forest area, and the strip system (culture en bandes) in the savanna region. Both systems are flexible but usually the strip system consists of alternating strips of cultivated land with strips of grass fallow. The corridor system alternates corridors of cultivated land with corridors of bush or forest fallow, which is maintained 15 or 20 years.

The Paysannat Settlement Plan.--Use of one version or another of the corridor or strip system is almost always an integral part of the government's paysannat settlement plan, which takes its name from the French word paysan, meaning peasant. The plan has three aims:

1. To maintain soil fertility and facilitate the use by Africans of farm techniques likely to increase yields and improve quality of output.

2. To settle the rural population and improve their living standards. Such improvement is difficult when the Africans pull up stakes and move every 4 or 5 years.

3. To increase yields and total production, so that there is enough for domestic use and some to sell.

Experiments with paysannats were begun in the 1930's. This new form of settlement and organization was so successful that it was given a central position in the Ten-Year Plans for the Belgian Congo and Ruanda-Urundi. The plans envisage the settlement by 1960 of 500,000 African farmers on more than 12,350,000 acres of land. By 1957, in the Belgian Congo alone, 175,000 African farmers had been allotted about 3,700,000 acres in 200 paysannats.

Before a paysannat is established, detailed investigations are made of the area concerned, with a view to securing a reasonably fertile block of land, and determining the rotations adapted to the land, local customs, and economic needs. Also studied are the political organizations and hierarchy of the tribe, ownership rights, and the land system in force. The aims and methods of the paysannat are explained to the chief, other notables, and family heads. If the customary tribal authorities approve and ask for it, a paysannat is organized. Once a group is organized into a paysannat, the African members are in the army, so to speak. They must follow the orders of the government agronomists as to what and how much to plant, when to plant, and how and when to cultivate and harvest.

The duration of the crop cycle and fallow period in the paysannats differs according to the natural regions in which they are located, the fertility of the land, the possibilities of the various crops, etc. Field crops are the mainstay of most paysannats, but some have been founded on tree crops.

In the future, it is expected that the paysannats will have mechanization and fertilization. Fertilization is expected to shorten the duration of the bush fallow period. Some success has been achieved on pilot scheme paysannats.

European Colonization.--Although the government has an elaborate program for Belgian colonization in the Congo, the number of European agricultural colonists, or colons, has not increased appreciably. In 1953, there were only 1,224 in the Congo, of whom 970 were Belgians and 254 "other Europeans." The colons are allowed to settle in specified areas in the reasonably healthful highlands, not in the tropical lowlands.

The long, detailed stages of investigation, training, and education which the government requires of colon candidates have undoubtedly kept their numbers

low, even though candidates who qualify are given generous financial inducements and tax rebates during their early years of farming in the Congo.

The government's plan for keeping European and African farmers separated by geographical area and by crops grown has succeeded rather well, and African-European conflicts have been kept to a minimum.

Plantations.--Land "conceded" to large companies owned by European capital is held by the concessionaires on a sort of homestead basis. The largest tract, more than 1,850,000 acres, was conceded in 1911 to Huileries du Congo Belge, a subsidiary of Unilever. In 1956, the company got freehold rights to 500,000 acres. Had it met all its development responsibilities--including the building of oil mills of specified capacities and the export of certain quantities of oil--it could have had much more of the land.

Production Practices.

In the Belgian Congo, especially in the equatorial rain forest, clearing of trees from land to be farmed plays a much more prominent role than on long-established farms in the Temperate Zone. Africans use axes, machetes, and fire to clear land. The government and large plantation operators use these implements plus power saws, tractors, and bulldozers.

Once his land is cleared, the African farmer not in a paysannat breaks and cultivates his land with a short-handled hoe. On some paysannats the government breaks the land with tractor plows, charging the African for this service, and allows him to cultivate his crop with a hoe. On large European-owned plantations, some tractors are used for cultivating. Horses, mules, donkeys, and oxen are rarely used as work animals.

Cassava grows between rows of cooking bananas, or plantains. These are the two most important domestic food crops in the Congo.

Goldstein, Congopresse

With its continuously warm, wet climate, it would seem that the equatorial rain forest could grow several crops per year. Indeed it is possible in some areas to grow two crops of corn in a year, or a crop of corn and a crop of cotton, or a crop of peanuts and a crop of cotton. However, a substantial part of the cropland is in short-lived perennials, such as cassava (manioc) and sugarcane, and trees bearing such crops as oil palm fruit, coffee, and cocoa. Savanna areas, with a dry season of some length, can produce only one annual crop a year.

Intercropping or interplanting (growing two or more crops on the same land at the same time) is widely practiced, especially by Africans growing domestic food crops. Combinations such as these are typical:

1. Bananas, cassava, and rice.
2. Cassava, corn, rice, and bananas.

Operators of tree-crop plantations often use sweetpotatoes, cassava, or other short-lived plants to cover the ground until their oil palms, coffee trees, or other trees shade the ground. Young cacao trees are sometimes planted in the shade of mature rubber trees. At times, the tall forest trees are left to shade young plantation trees; perhaps this too can be called a form of interplanting.

As has been noted, rotations in the Congo are often "bush back to bush" arrangements. On their own, the African farmers have followed various crude rotations. INEAC agronomists have only been able to offer refinements of such rotations of annual crops and short-lived perennial crops. Here is a typical rotation, recommended for cotton regions north of the Equator, particularly in the forest zone:

1st year after clearing--rice, bananas, cassava.
2nd year--bananas, cassava (beginning of harvest).
3rd year--bananas, cassava (end of harvest).
4th year--corn, gourds, beans, and various other food crops, followed by cotton the same year.
5th year--peanuts, followed by cotton.
6th year to 20th year--bush fallow.

Two key words to future agricultural progress in the Belgian Congo and Ruanda-Urundi are undoubtedly "mechanization" and "fertilization." Commercial fertilizer is not manufactured in the Belgian Congo and Ruanda-Urundi and little is imported. The Food and Agriculture Organization of the United Nations (FAO) reported that 990 short tons of commercial nitrogenous fertilizers were used in the Belgian Congo in the year from July 1956 to June 1957. Cover and green-maure crops, such as Stylosanthes gracilis, need to be used more extensively. These protect the soil from torrential rain and blazing sun and add organic matter.

Government Policies.

The 10-Year Development Plans.--The Belgian Congo and Ruanda-Urundi both have 10-year development plans covering a wide range of economic and social subjects and generously supplied with funds.

While only about 5½ percent of the Belgian Congo's development plan funds are assigned directly to agriculture, almost all the money is spent on plans which affect agriculture.

The plan, intended to operate during the period 1950-59, and as its chief objective the stabilization of the colony's economy by creating a domestic market. In 1948 government investment in the plan was estimated at $510 million. The heaviest expenditure was to be for "infrastructure" (roads, railroads, electricity generation, airports, docks, communications, etc.), which accounted for nearly 60 percent. Road building alone was estimated to require nearly 24 percent, but was dropped to only 14½ percent when the estimates were revised in 1957. Inflated costs and revisions doubled the total expenditures--to $1,019 million.

Perhaps the best idea of the plan can be gained by a close study of the esimated allotments as made in 1948 and as revised by 1957: (The figures shown are for the whole 10-year period, not for a single year.)

TABLE 1.--Belgian Congo: 10-year development plan, comparison of cost estimates by type of project, 1948 and 1957

Type of project	Estimated in 1948	Percentage of plan as whole	Estimated in 1957	Percentage of plan as whole
	Million dollars	Percent	Million dollars	Percent
Economic:				
Transportation:				
Railroads	25.3	4.9	95.6	9.4
Roads	122.0	23.9	147.1	14.4
Water	88.6	17.4	149.3	14.7
Air	19.3	3.8	45.4	4.4
Electricity:				
Generators	38.1	7.5	68.3	6.7
Total	293.3	57.5	505.7	49.6
Social:				
Water and electricity supply	32.3	6.3	45.7	4.5
Street lighting	--	--	2.7	.3
Housing for Africans.	38.0	7.5	90.4	8.9
Health and medical installations	39.4	7.7	63.3	6.2
Teaching for Africans	36.8	7.2	54.6	5.4
European settlement	5.3	1.0	6.0	.5
Total	151.8	29.7	262.7	25.8

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TABLE 1.--Belgian Congo: 10-year development plan, comparison of cost estimates by type of project, 1948 and 1957 - Continued

Type of project	Estimated in 1948	Percentage of plan as whole	Estimated in 1957	Percentage of plan as whole
	Million dollars	Percent	Million dollars	Percent
Agricultural development:				
African agriculture	15.6	3.1	20.2	2.0
African livestock raising	3.6	.7	5.7	.6
Fishing and fish-breeding	1.8	.3	2.5	.2
Scientific and experimental research:				
INEAC	6.8	1.3	19.6	1.9
IRSAC	--	--	1.2	.1
Motor-fuel project	--	--	.5	--
Forestry	--	--	3.5	.4
Special agricultural programs and tea processing plants	--	--	5.3	.5
Total	27.8	5.4	58.5	5.7
Public services:				
Town planning and civil building	24.0	4.7	168.0	16.6
Storing and preserving of produce	5.0	1.0	2.6	.3
Surveying and map-making	2.2	.5	3.3	.3
Geology and hydrology	.5	.1	1.5	.1
Weather reporting	.6	.1	2.1	.2
Telegraph and telephone	5.0	1.0	13.9	1.4
Public transportation	--	--	.5	--
Total	37.3	7.4	191.9	18.9
Grand total	510.2	100.0	1,018.7	100.0

Note: Column 3 does not add because of rounding.

The Belgian Government has made no appropriation, grant, or subsidy to the plan. It does guarantee payment of loans, which are floated in Belgium and the Congo and on foreign money markets.

A 10-year plan, entirely separate from that of the Belgian Congo, was launched in 1952 for Ruanda-Urundi. The plan, financed by interest-free loans from Belgium, emphasizes the development of transportation, the increase and modernization of agricultural production, and the improvement of the well-being of Africans. About half of the funds ($40 million) had been spent on the plan through 1956, an estimated 45 percent of it for programs considered immediately productive in economic returns; much of the remainder was devoted to social developments.

Plans are already under way for second 10-year plans in both the Belgian Congo and Ruanda-Urundi. Emphasis in these periods will be on increased production, particularly in agriculture.

Education, Research, Extension.

Education for Africans in the Belgian Congo has been compared to a broad-based pyramid; a high proportion has had first-grade education, but only a very very few have college education. The literacy rate in the Belgian Congo has been increasing more rapidly than in most African countries. Ten percent of the population is in primary school.

The majority of the schools are operated by church missions, most of which are subsidized by the government. Twenty-six secondary schools offer 2 to 3 years of instruction in agricultural subjects and five offer 4 years. In addition, two schools offer instruction in veterinary medicine at the secondary level. About 1,900 pupils attended these schools in 1957.

Two practical farm schools (Ferme-Ecoles), mostly for training European agricultural colons, operate at Mushweshe (Kivu Province) and Lula (Oriental Province).

The Congo's first university, Lovanium University, was established near Leopoldville in October 1954, and offers some agricultural courses. It is under the sponsorship of Louvain University in Belgium. In October 1957, over 150 African, European, and Asian students were registered. The following year the Belgian Congo and Ruanda-Urundi State University was established. Its main site is at Elisabethville. For the second academic year, 150 students were registered, including 27 Africans from various parts of the Belgian Congo and Ruanda-Urundi. An affiliated Agricultural Institute was to be established in October 1958 at Astrida, Ruanda-Urundi.

Agricultural Research.--Most agricultural research is done by the Institut National pour l'Etude Agronomique du Congo Belge, or INEAC, as the National Institute for the Agronomic Study of the Congo is known. Founded in 1933, it has achieved a worldwide and well-deserved reputation.

Basic research is carried on by 20 different sections at the principal research station at Yangambi, on the Congo River. The types of research include "the study, improvement and selection of all the different crops, the testing of the best cultivation methods, the study of soil and climate conditions, of forests, parasites, stock-farming, fish-breeding, etc., as well as

basic biological, genetic and botanical research."

In addition, there are 60 experimental centers and stations scattered throughout the country. In all about 400 European scientists, plus a number of African assistants, are employed.

In addition to its pure and applied research, its numerous scientific publications, and its valuable demonstration work, INEAC has distributed improved seeds and plants on a massive scale (more than 2,200 short tons of seeds and 5 million plants between 1951 and 1956). Its work is reflected in increased yields and increased total production of domestic field crops as well as export crops, such as palm oil, rubber, and coffee. INEAC has also done work in erosion control, insecticides, and fertilization, and a notable invention of its staff is the paysannat.

While not primarily charged with agricultural research, IRSAC, or the Institut pour la Recherche Scientifique en Afrique Centrale, has some projects in hand relating to agriculture, particularly one on tsetse fly control.

Agricultural Extension.--Nearly 7,000 Europeans and Africans are employed by the provincial governments of the Belgian Congo. In 1957 these included 82 agricultural engineers (European), 400 assistant agronomists (European), 202 agricultural assistants (African), and 6,197 Moniteurs (African).

Among the projects carried out by the extension service are soil and ecological surveys, crop rotation, farmer education, and marketing.

Agricultural Production

Tropical tree crops for export are a dominant part of the agriculture of the Belgian Congo and Ruanda-Urundi. These include coffee, palm oil and palm kernels (both products of the oil palm), rubber, cocoa, tea, table bananas, and cinchona (for quinine). Despite their high money value, these crops were gathered from trees occuping just 10 percent of the area harvested in 1958. Classified another way, oil-bearing crops make up a large proportion of agricultural production. In addition to palm produce, the area harvests cottonseed, peanuts, sesame, castorbeans, and soybeans. The oil-bearing crops, including oil palms, occupied about 21 percent of the harvested area in 1958.

Other important export crops include lint cotton, cassava flour, urena and punga (coarse fibers like jute), pyrethrum (an insecticide), sisal, and essential oils, such as rose geranium and lemongrass.

Food crops for domestic use include cassava (manioc), plantains (cooking bananas), corn, rice, beans and peas, sweetpotatoes, grain sorghum, millet, potatoes, wheat, and sugarcane. These occupied about 70 percent of the area harvested in 1958. There is considerable home consumption of some export crops, notably palm oil and peanuts.

TABLE 2.--Crops: Acreage and production, Belgian Congo and Ruanda-Urundi, 1958

Crop	Acreage	Production
	1,000 acres	1,000 short tons
Coffee	306	87
Palm oil (commercial)	460	250
Palm kernels (commercial)	From same fruits as palm oil.	159
Seed cotton	857	164
Rubber	143	41
Cocoa	38	5
Fresh cassava (manioc)	1,806	9,835
Peanuts (in shell)	711	193
Urena and punga	24	15
Tea	10	3
Table bananas	53	46
Plantains	1,050	4,187
Pyrethrum (flowers)	10	2
Quinine (bark)	9	2
Corn	1,178	569
Rice (paddy)	404	194
Perfume plants (essential oils)	2	(1/)
Beans and peas	1,387	483
Sweetpotatoes	538	1,619
Grain sorghum (Ruanda-Urundi only)	423	247
Millet (eleusine - Ruanda-Urundi only)	117	31
Potatoes	54	127
Sesame	42	6
Wheat	27	9
Castorbeans	16	1
Soybeans 2/	15	4
Sugarcane (as cane)	14	259
Tobacco (all tobacco in Ruanda-Urundi; commercial only in Belgian Congo)	9	4
Sisal	2	(1/)
Other cereals	210	64
Other roots and tubers	35	92
Other fruits	9	26
Other miscellaneous crops	29	38
Total	9,988	18,762

1/ Less than 500 short tons.

2/ Estimated by U. S. Agricultural Officer.

TABLE 3.--Crops: Acreage and production, by political region and by national origin of farm operator, Belgian Congo and Ruanda-Urundi, 1958

Crops	Acreage				Production			
	Belgian Congo		Ruanda-Urundi		Belgian-Congo		Ruanda-Urundi	
	European	African	European	African	European	African	European	African
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Coffee	189.7	46.5	2.4	67.4	50.9	8.4	0.5	27.7
Palm oil (commercial)	295.8	146.4	(1/)	18.2	235.2	13.7	.1	1.3
Palm kernels (commercial)	From same fruits as palm oil				102.9	55.6	(2/)	.2
Seed cotton	0	838.7	0	17.5	0	157.1	0	6.6
Rubber	118.6	24.7	0	0	37.4	3.9	0	0
Cocoa	38.1	.3	0	0	5.3	(2/)	0	0
Fresh cassava (manioc)	3.6	1,570.6	0	231.4	13.7	8,320.6	0	1,500.7
Peanuts, unshelled	.3	682.7	0	28.5	.1	186.0	0	7.4
Urena and punga	0	24.2	0	0	0	14.9	0	0
Tea	8.8	.1	.7	0	2.8	(2/)	.1	0
Bananas (table)	39.9	13.4	0	0	27.9	18.1	0	0
Plantains	.8	553.2	0	495.7	1.4	1,955.9	0	2,229.4
Pyrethrum (flowers)	7.3	.1	2.2	.6	1.3	.1	.6	.3
Quinine (bark)	7.8	0	.7	0	1.8	0	.1	0
Corn	3.9	826.1	0	348.3	2.8	350.2	0	216.0
Rice (paddy)	0	402.7	0	1.6	0	191.1	0	2.5
Perfume plants (essential oils)	1.6	.5	.3	0	.1	(2/)	(2/)	0
Beans and peas	(3/)	294.3	0	1,092.7	(2/)	75.4	0	407.6
Sweetpotatoes	.5	120.7	0	416.5	1.7	335.6	0	1,281.4
Sorghum	(1/)	(1/)	0	422.6	(1/)	(1/)	0	247.4
Millet (eleusine)	(1/)	(1/)	0	117.3	(1/)	(1/)	0	31.1
Potatoes	.3	5.2	0	48.5	.4	14.3	0	112.7
Sesame	0	42.1	0	0	0	5.5	0	0
Wheat	0	9.0	0	18.4	0	3.0	0	5.7
Castorbeans	0	0	0	15.6	0	0	0	1.4

Sugarcane (as cane)	11.9	2.2	0	0	248.4	10.4	0	0
Tobacco (commercial production only in Belgian Congo)	1.1	2.4	0	5.6	.4	1.7	0	2.0
Soybeans	(4/)	(4/)	0	2.6	(4/)	(4/)	0	.8
Sisal	1.5	0	.4	0	.2	0	(1/)	0
Other cereals	.1	206.0	0	3.6	(2/)	62.8	0	1.6
Other roots and tubers	0	6.3	0	28.2	0	17.0	0	75.3
Other fruits	2.5	6.6	(1/)	0	1.3	24.4	.1	0
Other miscellaneous crops	1.3	10.5	1.7	15.5	5.1	20.2	2.6	10.3
Total	735.4	5,835.5	8.4	3,396.3	741.1	11,845.9	4.1	6,169.4

1/ Not available.

2/ Less than 50 short tons.

3/ Less than 50 acres.

4/ Not available by national origin of operator.

Lamote, Congopresse

Growers dry their Robusta coffee in open-air trays, Oriental Province. Coffee is the most valuable agricultural export.

Coffee.

Coffee is now the most valuable agricultural export of the Belgian Congo and Ruanda-Urundi. In 1958, coffee weighing 79,000 short tons (about 1,200,000 bags of 132.276 pounds each) and valued at $56 million was exported. This was almost 14 percent of the total value of all exports (agricultural and nonagricultural). In 1958 also, coffee production in the Belgian Congo and Ruanda-Urundi was about 13 percent of that for Africa and a little over 2 percent of world production. It was 87,000 short tons from 306,000 acres of trees of bearing age--an average yield of 569 pounds per acre.

In the Belgian Congo itself, two-thirds of the coffee area lies north of the Equator. Because of better soils and climate, yields in this northern region are larger than in the southern coffee area. Ruanda-Urundi, all of which lies south of the Equator, is also an important coffee producer.

The rapid expansion of coffee production in the Belgian Congo and Ruanda-Urundi is well illustrated by comparison of the 21,500 short tons (325,000 bags) exported in 1940 with the 79,000 short tons (1,200,000 bags) exported in 1958--over $3\frac{1}{2}$ times as much 18 years later.

Another indicator is the large acreage of trees that was not yet of bearing age in 1957. In the Belgian Congo itself, 151,800 acres were young trees, mostly of the Robusta variety. This was 75 percent of the area in bearing trees in the Congo proper that year. Since trees begin to bear at 2 or 3 years and continue to bear for 25 or 35 years, it can be seen that only a small part of the young acreage was needed for replacement of trees no longer productive.

By variety, the area in bearing trees in 1957 was divided as follows:

	1,000 acres	Percent
Robusta	167.2	82
Arabica	35.9	18
Belgian Congo . .	203.1	100
Robusta	1.1	2
Arabica	68.8	98
Ruanda-Urundi . .	69.9	100

Coffee seedlings are grown in nurseries. Some are grown direct from seed and others are grown from seed and grafted with clonal material of improved varieties. When transplanted to the fields at the rate of 400 per acre, the seedlings are placed between shade trees. Additional cover is furnished by such plants as Pueraria, Stylosanthes gracilis, and sweetpotatoes planted between the seedlings.

Arabica trees come into bearing at about 3 years. If not pruned, they would reach a height of 25 to 35 feet. Robusta trees bear a bit earlier, sometimes at 2 years, and if unpruned, would grow 25 to 50 feet high.

Coffee harvest is a laborious hand process of picking the tiny fruits from the branches. Since the fruits are red when ripe and about the size of cherries, that is what they are called. Each cherry contains 2 beans inside a hull. The beans are further protected by an inner "parchment." As the cherries do not ripen all at once, the branches of the coffee tree must be picked over several times during the harvest season. In the Congo north of the Equator, coffee picking begins in late October and continues to early February. In the south, harvest is in July and August.

After picking, coffee is handled by one of three processes:

(1) Dry method. The coffee cherries may be dried in the sun on earth or concrete floors or on trays placed above the ground. Because of sudden showers, many growers prefer to dry their coffee in stationary or rotary dryers with artificial heat. After drying, the hulls and parchment are removed mechanically in one operation. About half the Robusta coffee is

handled by this dry method.

(2) Wet method with fermentation. The hull is first removed with a depulping machine and the beans soaked in vats from 12 to 48 hours. This fermentation liquefies the gum clinging to the parchment. The gum is washed away in running water, the beans are dried, and the parchment removed mechanically.

(3) Wet method without fermentation. This method is the same as the wet method described in (2) above, except that the hulling, removing of gum, and washing are all done mechanically by means of the "Raoeng Depulper."

About 50 percent of the Congo's Robusta coffee is processed by these wet methods. Most of the European-owned plantations are equipped with hulling and cleaning machinery. The Africans usually sell their coffee unhulled, either to government-operated cooperatives or to local buyers.

All exports of Robusta coffee are controlled by the Office du Café Robusta, which grades and cleans it for export and issues grade certificates and export licenses. The Office charges about nine-tenths of a cent per pound for its services.

Arabica coffee produced in Oriental Province is exported through the Office des Produits Agricoles de Stanleyville and that produced in Kivu Province through the Office des Produits Agricoles de Costermansville, a city now known as Bukavu.

Arabica and Robusta exports from Ruanda-Urundi are controlled by the Office des Cafés Indigènes du Ruanda-Urundi.

Leaf rust (Hemileia vastatrix) attacks Arabica trees planted at low altitudes but is not a particular cause of damage to Robusta trees.

Belgian Congo and Ruanda-Urundi did not join the World Coffee Agreement signed in Washington, D. C., in September 1959.

Oil Palm Produce.

The oil palm industry of the Congo is highly organized and industrialized--undoubtedly the best managed palm operation in Africa.

Production figures are difficult to obtain for palm produce and export figures often must suffice. In 1958, the Belgian Congo and Ruanda-Urundi exported 45 percent of Africa's palm oil exports and 28 percent of world exports. While the area exported only 5.2 percent of Africa's exports of palm kernels (4.8 percent of world exports), it exported a large percentage of the palm kernel oil that entered world trade.

The Belgian Congo is the only oil palm producing area of the world which crushes a large part of its own palm kernels. Other areas ship their palm kernels to Europe for crushing. Much oil palm produce comes from large integrated companies which handle everything from planting seeds in the nursery to

crushing the oil--and even to export of palm produce and final manufacture of consumer goods. The largest company is Huilever du Congo Belge.

Palm produce (palm oil, palm kernels, palm kernel oil, and palm kernel cake) makes up the Belgian Congo's second most valuable agricultural export. For many years it was the most valuable. In 1958, its export value of $54,480,000 was over 13 percent of the value of all exports (agricultural and nonagricultural).

Of the total commercial oil palm tree area of 460,000 acres, about 64 percent is in European plantations with the remainder in African holdings, including some cultivated plantations. About 96 percent of the oil palm area is in the Belgian Congo proper.

Cruz, Congopresse

Palm fruit along roadside awaits transport to mill. Oil palm produce is No. 2 agricultural export.

The oil palm (Elaeis guineensis) requires a warm and humid climate with an average annual temperature not much above or below 68°F. It grows best at less than 2,000 feet above sea level. It needs plenty of sunshine, so operators of commercial plantations clear away the standing trees of the equatorial rain forest before setting out seedlings. In the Congo, the best growing conditions are found along the Congo River and its main tributaries. Plantations are found inland over 900 miles from the main ocean ports.

Palm seeds are sprouted in boxes, kept for several months in the nursery, and finally transplanted to the groves at the rate of 58 trees per acre. Many of the plantations operate their own palm nurseries. INEAC distributes improved palm seed in quantity for use in new palm plantings.

Some of INEAC's most valuable work has been done in breeding oil palm trees with a high oil yield and a high percentage of oil. While plantations planted with good ordinary varieties will produce 700 to 900 pounds of oil per acre, those planted with tenera x tenera crosses yield around 1,300 pounds per acre. In the newer plantations, established with tenera x dura and dura x pisifera crosses, production is especially superior. Yield of industrial palm oil has reached 2,600 pounds per acre on plantations with 7- to 8-year-old dura x

pisifera trees. These yields are for palm oil only and do not include palm kernels or palm kernel oil. Bearing begins in the third or fourth year, if conditions are favorable, and reaches a maximum from about the 11th to the 30th year. When 25 to 30 years old the trees reach such a height that they are dangerous to climb. Under these conditions, it may be more economical to start a new plantation than to continue harvesting the old tall trees.

Palm fruits grow in tight bunches, consisting of scores of fruits, at the crown of the tree. Bunches of fruits average from 35 to 55 pounds, of which 60 to 65 percent is actually fruit. A tree will carry several bunches of varying degrees of ripeness at any given time. The fruit of the oil palm contains a kernel in a hard shell, surrounded by the fleshy pulp. While not exactly analagous, the palm fruits can be compared to a peach kernel inside the peach seed, surrounded by the fleshy "halves" of the peach. Of course, the palm fruit is oily while the flesh of a peach is not.

African harvesters climb the oil palms, cut down the bunches, and carry them in baskets to the roadside or collection stations. Trucks or narrow-gage railways carry the bunches and loose fruits to the oil mills, most of which are owned by the plantation operators. The mills also buy palm fruit from African farmers, who ordinarily pluck the fruit from the stalk before selling. Harvesting goes on the year around but is heaviest during the rainy season.

To keep down the proportion of F.F.A. (free fatty acid), the palm fruit is sterilized as soon as possible after being picked. The fruits are then removed from the stalks, either mechanically or manually, mashed, and the oil squeezed out and filtered. Oil recovery rates in modern Congo mills are over 90 percent, as compared with much lower recovery rates in primitive African home processes. Palm oil is of the olive-oil type.

The residue from processing the oil from the fruit consists of resinous fibers and the still-unbroken palm nuts containing the kernels. The nuts are separated from the fibers by machine, dried with steam, and broken open with centrifugal crackers. The kernels are separated from the shells by placing in a mud bath or a salt solution of 1.15 density. Many modern mills now make the separation by "hydrocylonage." Finally the kernels are washed, dried, and sacked for export or for later crushing within the Congo. The stalks, fiber, and shells are used as boiler fuel in the oil mills. Palm kernel oil is a lauric-oil type, somewhat similar to coconut oil.

In recent years, the Congo Government has encouraged crushing of palm kernals in the Congo by allowing palm kernel oil to be exported duty-free, while placing a 12-percent export tax on palm kernels. If carefully processed, palm kernel oil can be of better quality than palm oil (that is, have a lower F.F.A. content).

The best grades of palm oil and palm kernel oil go into margarine, cooking fats, chocolate bars, and other food products. The intermediate grades of palm oil are used in soap and candles, and the industrial grades (with a high F.F.A. content) into steelmaking and mining processes. Palm kernel oil is in particular demand for baked goods which require a long shelf life and for

making shaving soaps with a stiff, fine-grained lather. The palm kernel cake makes a nutritious livestock feed.

Aside from commercial production, large quantities of palm oil are made by crude primitive methods (boiling and mashing the fruit and draining off the oil). This palm oil is used by Africans as food, for lighting, and as body oil.

Cotton.

While cotton in 1958 was the third most valuable agricultural export of the Belgian Congo and Ruanda-Urundi, its place in the economy as a "civilizing agent" is even more important than its area and production totals would seem to justify. In the specified cotton areas, most African families raise about an acre of cotton. This supplies the family with a few francs to buy some small elements of civilization--simple clothing, enamel cookware, salt, dried fish, trinkets, etc.

Cotton production in the Belgian Congo and Ruanda-Urundi in 1958 amounted to about 5 percent of Africa's production, or slightly less than one-half of 1 percent of world production. In 1958, about 164,000 short tons of seed cotton were produced on 857,000 acres of land, an average yield of 383 pounds of seed cotton per acre. With a lint turn-out of 34 percent, a total production of 56,000 short tons (equivalent to 233,000 bales of 480 pounds net) of lint cotton is indicated. Production has slowly moved upward over the years. Though in the paysannats the government has recently plowed some cotton land before planting and has applied insecticides by airplane, its policy has been to keep cotton as a crop to be grown only by Africans without much livestock or mechanical workpower. If the new government continues this policy, cotton acreage will probably increase only gradually.

Hoeing a field of cotton in government-planned African farm settlement, called a paysannat. All cotton is grown by Africans.

Goldstein, Congopresse

Cotton is grown in three areas of shifting cultivation, and takes its turn in the crude rotation of crops. One area is north of the tropical rain forest in Oriental and Equator Provinces; a second, south of the forest in Kasai, Katanga, and Kivu Provinces; and a smaller third, around the northern shores of Lake Tanganyika in Kivu Province and in Ruanda-Urundi. Part of the cotton land is savanna and part former forest land.

After picking--the fields must be gone over more than once--African farmers hand carry their seed cotton (seed and lint as it naturally grows) in baskets or sacks as far as 6 miles to one of the 2,000 or more buying stations set up by 10 quasi-official cotton companies and one individual colonist. At the buying stations, the cotton is weighed, paid for, and hauled to one of 112 modern saw gins operated in the Belgian Congo and Ruanda-Urundi.

At the cotton gins, the lint is separated from the seed. The lint is packed in 220-pound bales (100 kilograms), less than one-half the weight of U. S. cotton bales. The light bales facilitate the many handlings they get on their way to the export dock at Matadi. Truck, rail, and river transportation are all used.

Cottonseed is crushed at several mills in the cotton areas. Production in 1957 in the Belgian Congo totaled 9,400 short tons of oil and 25,800 short tons of cottonseed cake. Production for Ruanda-Urundi is not available.

Strict attention is given to seed purity, cleanliness in picking, and care in ginning and handling.

Cotton wilt and fungus diseases cause some damage. Insect pests--Helopeltis in the northern zone and lygus bugs in the main southern zone--also cause some damage. In both zones, cotton stainers hurt cotton by attacking the young bolls. There is no infestation of Mexican boll weevil.

When picking is complete, the cotton plants are burned. Until recently this was about the only measure taken to combat disease and insect damage. In 1956 it was reported that 32,900 acres of cotton in the northern zone and 167,000 acres in the southern zone were treated with insecticides. Application was mostly with hand, two-row dusters. It was expected that in 1958-59, airplanes would be used to dust about 12,000 acres of cotton in Ruanda-Urundi.

The Belgian Congo proper has a cotton textile industry which uses about 12,000 short tons (50,000 bales of 480 pounds net) a year. It has 8 cotton textile mills, including one in Leopoldville employing 4,100 workers. Locally grown cotton is used.

Rubber.

Production and export of rubber in the Belgian Congo have been increasing at an almost geometric progression. Exports of 38,700 short tons in 1958 were almost 7 times as much as in 1948 and 34 times as great as in 1937. With 66,600 acres of young trees not yet of bearing age in 1957 (47 percent as large as the area in bearing trees for that year), this rapid rate of expansion is assured for the immediate future. No rubber is grown in Ruanda-Urundi.

While Africans cultivated only 17 percent of the acreage in bearing rubber trees in 1957, they owned 50 percent of the acreage in young trees, indicating a rather rapid change in the ownership basis.

In 1958, Belgian Congo's exports of natural rubber amounted to 29 percent of Africa's exports and 1.8 percent of world exports. In value of agricultural exports in 1958 from Belgian Congo and Ruanda-Urundi, rubber took fourth place, after coffee, palm produce, and cotton.

Rubber is principally cultivated in the equatorial regions, especially in Equator Province. Rubber trees normally require a hot climate with frequent rains throughout the year. However, some strains have been developed which can stand some months of dryness.

Hevea (rubber) plants are raised in nurseries and carefully grafted with clones of high-production strains. They are further preselected before transplanting in order to choose the plants with the highest yield. The saplings are planted thickly at first and later thinned out.

The hevea trees are tapped for their sap like pines for turpentine or maples for sugar. The first cuts are made when the trees have a circumference of 18 inches measured 39 inches above ground or above the graft. This stage is reached at about 5 years in the Central Basin and toward the age of $6\frac{1}{2}$ to 7 years elsewhere. The bark is slashed and the sap (latex) collected in small sap buckets. A new cut must be made each morning soon after dawn. By about 10:30 a.m., the flow of sap for the day is complete. The sap cups are emptied into sap buckets or pitchers. The latex thus collected is transported to the factory or to a reception station served by a tank truck.

The tapping must be very carefully done, taking a cut of one-sixteenth inch per day, and cutting no deeper into the cambium than one-twentyfifth inch. The bark regenerates in about 7 years and the same area of the bark can be cut again. A worker can tap 300 to 500 rubber trees in a day, or about 5 acres.

Tapping goes on the year around in the Central Basin. However, a period of daily tapping is followed by an equal period of rest--a month of tapping followed by a month of rest. In other areas, other schedules are followed, depending principally on the length of the rainy season. The trees are, of course, allowed to rest during the dry season.

At the coagulating plant, any lumps formed by spontaneous coagulation are strained out, along with any foreign matter. The latex is thinned with water and formic or acetic acid added to harden the liquid rubber. The mixture is agitated and vertical separators placed in the vat. The latex hardens into sheets of crude rubber, which are then kneaded or rolled mechanically. Simultaneously, streams of water pour over the rubber to wash away excess coagulant. The sheets of rubber are dried, sorted by grade, and baled for shipment. In 1957, there were 131 coagulating plants in the Belgian Congo, of which 73 were in Equator Province.

Since the Congo has no rubber manufacturing facilities, the entire output is exported. Practically all is exported via Matadi.

Cocoa.

Cocoa is a small but increasingly significant crop in the Belgian Congo proper. In 1958 it was the fifth most important agricultural export, although its export value was less than a fourth that of rubber, the fourth most valuable agricultural export.

In 1958, production in this area was about 1 percent of Africa's production and about six-tenths of 1 percent of world production.

In the Belgian Congo, cocoa is grown mostly on European plantations in Leopoldville, Equator, and Oriental Provinces. It thrives at altitudes no higher than 2,000 to 2,300 feet with an average annual temperature of between 75° and 82°F. It needs at least 60 inches of rainfall evenly spaced throughout the year, although it can withstand a short dry season. Constant humidity of about 80 percent is best for cocoa growing. The Congo has great areas favorable in these respects for cocoa, but has only limited areas with the deep, friable clay soils with good water-retention properties which cocoa trees require.

While cocoa can be propagated from cuttings, most Congo cocoa is grown from seed. The most popular variety is Forastero Amazonien (Amelonado), introduced from São Tomé, a Portuguese island in the Gulf of Guinea. INEAC is seeking to produce improved varieties which will produce good crops on the poor soils of the Belgian Congo.

In establishing plantations, the cocoa planters usually do not clear the forest completely, leaving some trees as shade for the young cocoa saplings. Some planters use cassava or bananas as temporary shade. Or the cocoa may be grown under the shade of interplanted oil palm or rubber trees.

The first fruit is generally produced in the fourth year. Full production is reached at 8 to 10 years and the economic life of a cocoa tree is about 50 years.

With seasonal fluctuation, cocoa harvest goes on the year round. The pods, red in color and about the size and shape of a child's football, grow attached direct to the trunk. The harvester cuts off the pods with a knife or machete, being careful not to damage the flower cushions on which future harvest depends.

The same day as harvested (or the next day at the latest), the pods are cut open and the beans, covered with sticky gum, put in vats to ferment. Most plantations have five to seven rows of vats (of about 1.3 cubic yards capacity per vat) in a shed. The fresh beans are put in the front vat and moved back one row each day. When removed from the back row the fermentation process is complete. The gum is dissolved and the beans are clear and brilliant.

All Congo cocoa is exported, mostly to the Netherlands, Belgium, and West Germany.

Prospects for expansion of Belgian Congo cocoa production appear rather bright. The proportion of young trees to bearing trees is high. If INEAC efforts to breed strains of cocoa trees suited to Belgian Congo soils are successful, an even more rapid expansion of the cocoa area seems indicated.

Cassava (Manioc).

While cassava is chiefly important as a domestic food crop for Africans, the flour has recently become of some importance as an agricultural export. In 1958, 45,300 short tons worth $2,439,000 was exported. Cassava is also exported as fragments or slices ("cossettes"), and used in making cassava starch, starch paste, flakes or lumps, and pearl tapioca.

Cassava (along with plantains) supplies most of the carbohydrates eaten by the Africans living in the forests and border regions. Both the roots and the leaves are eaten. Nutritionally speaking, the root is quite poor food. It contains 35 percent starch, no fat, and only 0.50 to 0.75 percent protein, 0.33 percent glucose, and 1 percent saccharine and dextrine. The rest is mostly cellulose. The green leaves have food values something like those of spinach. Africans say, "We get bread from the roots and meat from the leaves."

Judged by the amount of land used, cassava is the largest crop grown in the Belgian Congo and Ruanda-Urundi. It is popular for several reasons: Vigorous growth, high and certain yields, ease of planting, cultivation, and harvesting, likelihood of success on ground just cleared, resistance to drought, and ease of living storage in the ground. In general, cassava is grown in all parts of the Belgian Congo and in Ruanda-Urundi. Nearly all is grown by Africans; only about one-fifth of 1 percent is grown by Europeans. In 1958, 9,835,000 short tons of cassava were produced on 1,806,000 acres.

Cassava, native to South America, was introduced to Africa by Portuguese navigators about 1600. It is a semiwoody, shrubby plant which grows 6 to 10 feet high. While a perennial, it is usually allowed to grow only 18 to 24 months. The stem is rather fragile and pithy. The plant has leaves, flowers, and fruits, but is chiefly valued for its starchy underground roots.

Cassava is propagated by planting pieces of stalk 4 to 12 inches long, somewhat as sugarcane is planted. Since the cassava stalks have no food or other value, their use as planting material does not reduce the net yield. Cassava may be planted alone or as a mixture with corn, rice, bananas, or other food crops.

In the equatorial rain forest, plantings may be made at any time, but largest yields are secured when planting is done at the beginning of the rainy season. Two or more hoeings are needed to keep down weeds. Harvest begins in equatorial regions after about 12 months' growth. The roots rot in this region if left underground much longer. In regions with a dry season, the roots are at their best at about 18 to 24 months when they are about $4\frac{1}{2}$

to 9 pounds in weight. After this, the roots continue to live and grow, but tend to become woody and less starchy. In these dry-season areas, cassava can be left in the ground for use when needed or as insurance against failure of other crops.

The roots are dug with hoes. Then, peeled or unpeeled, they are steeped in deep, gently running water to remove the poison. (In this area, "bitter" cassava varieties are usually grown. The roots contain a poison, prussic acid, which must be removed before the roots are used for food.) The steeped roots are then peeled--if not peeled before steeping--and the fibrous center part removed. The roots are dried in the sun and pounded into flour.

Peanuts.

While a relatively small export crop, peanuts are an important domestic food item in the Belgian Congo and Ruanda-Urundi. They add protein and fat to the African diet, especially in areas where palm oil is scarce. They are grown almost exclusively by Africans in small patches, mostly in the savanna area but to some extent in the equatorial rain forest. The light sandy soils of these areas are best for peanuts, as they allow the nuts to grow easily beneath the soil.

Production in 1958 was lightly less than 5 percent of production for all of Africa and about 1¼ percent of world production. The 1958 production of 193,000 short tons of unshelled peanuts was from 711,000 acres, an average yield of 543 pounds per acre.

Exports in 1958 amounted to 6,800 short tons of peanut oil and 9,000 short tons of peanut oilcake.

Hands and feet are used in raising peanuts. The land is cleared by cutting brush with a machete and then burning. The soil is then loosened up with a hoe. The shelled peanuts are planted either with a hoe or by scraping a shallow hole with the foot, dropping in the seed peanut, and raking some dirt over it with the foot.

Peanut varieties grown include A/20, E 4/2, A 92, P 43, and P 50. The A/20, an improved indigenous variety, is noted for its productivity. The erect or bunch varieties (comparable to the Spanish varieties in the United States) are planted at the rate of 90 pounds per acre. Rampante or spreading varieties (comparable to U. S. runner peanuts) require 13 to 22 pounds of seed per acre. Early bunch varieties mature in 85 to 90 days, rampante varieties in about 5 months.

In regions with a dry season, maturity of the nuts can be judged by the yellowing of the leaves. In the equatorial rain forest, the tops remain green and maturity is determined by pulling up and inspecting a bunch or two of peanuts. Mature plants are dug with hoes and allowed to dry a while on the ground. Sometimes they are dried further in stacks built on poles arranged like the framework of a small hut. When thoroughly dry, the nuts in their shells are removed from the plants by hand or by beating on threshing floors with sticks.

Removal of the hulls (shelling or "decorticating") is done by hand or with movable power shelling machines. Oil content of shelled nuts ranges from 46 to 49 percent. However, for commercial use, the oil crushers of the Belgian Congo prefer unshelled nuts in order to obtain a higher quality of oil.

Peanuts placed in commercial channels are carried in sacks or baskets to shelling machines or buying stations. From these points they are carried by truck to crushing mills.

Urena and Punga.

These fiber plants make an important contribution to the rough textile needs and are also a small export item.

Urena lobata, a cultivated crop, is a woody annual which may grow as high as 16 feet. It requires rich, deep, and permeable soils, plenty of sunshine, and regularly spaced rains. It is grown in Leopoldville Province by Africans.

Urena is usually the first crop in a rotation after clearing of the forest. In good savanna soils, a crop of peanuts or of corn is sometimes planted before planting urena. In patches expected to be harvested for fiber, the Africans broadcast the seeds thickly so that the stalks will grow tall with few branches. The seed patch is planted thinly so that the plants will branch readily and produce seed abundantly.

Harvesting is done at full flowering, at which time the fibers are at their best. The stems are cut down with a machete and the top leaves stripped off. The stalks are then retted in stagnant or slowly running water for 14 to 18 days. The fibers are then laboriously removed by hand, dried in the sun, pounded to soften the fiber, graded, tied in bundles, and finally baled. An adult can separate only 11 to 13 pounds of dry fibers per day. This slowness of processing places a definite limit on the area which a family can handle.

Urena fibers are good for all uses for which Indian jute is suited--sacks, bale covers, ropes, linoleum, sail cloth, etc.

Punga is the Congo native term for two wild plants, Triumfetta cordifolia and Cephalonema polyandrum. While not planted and cultivated, these plants are harvested, processed, and used like urena. Their fibers are not as fine in quality, however.

Tea.

Tea is a specialty crop of increasing importance in the eastern Belgian Congo. Production increased 29 times in the Belgian Congo itself, from 96 short tons (only) in 1948 to 2,791 short tons in 1958. It practically doubled in a single year--from 952 short tons in 1955 to 1,863 short tons in 1956. Some tea is also grown in Ruanda-Urundi.

Most of this crop is grown by Europeans but some tea plantings are now being made by Africans and will soon come into bearing. Production of tea in the Belgian Congo and Ruanda-Urundi was about 6 percent of Africa's production

and about one-third of 1 percent of world production.

Tea is cultivated on the humid flanks of the mountains which extend to the west of Lake Kivu. It requires a relatively cool but very humid climate and an acid soil. In Kivu Province, it grows best at about 3,300 feet altitude. Annual rainfall must be 60 inches or more.

The Assamica variety is used here. Seedlings are grown in nurseries from seed or cuttings. The young plants are transplanted to level or hillside fields at the rate of 2,500 to 3,750 plants per acre. If allowed to grow freely the bushes would reach 35 to 40 feet, which would make picking difficult. Thus pruning is constantly required during the life of the tea bushes.

Tea bushes require great quantities of nitrogen for the continued production of leaves. Best yields of leaves are secured when 350 to 450 pounds of sulfate of ammonia per acre are applied when the bushes are in leaf.

Harvesting consists of picking off the bud and two or three leaves. In the Kivu, the leaves are picked every 8 to 14 days, generally by women and children. On the average, a person can pick about 35 pounds of leaves in a day. The leaves are wilted, rolled by machine, screened, fermented, and finally dried.

All of the Congo product is fermented black tea. Three government processing plants are operated at Mokotos, Ngweshe, and in the Osso region. The largest, at Mokotos, has an annual capacity of 880 short tons. In addition, there are 13 privately operated processing plants, with capacities of 110 to 550 short tons each. Some of the local crop is consumed domestically in the Belgian Congo and Ruanda-Urundi and the rest exported. Nearby Chad (a part of the former French Equatorial Africa) is a good market.

Tea growing seems to have a bright future in this area, as quality is acceptable, even in the discriminating British market, and there is suitable land for further expansion.

Plantains and Bananas.

While their fruits are used in different ways, plantains and bananas are species of the same family and the plants themselves are hard to tell apart.

Plantains, often called cooking bananas, carry the scientific name Musa paradisiaca. By weight, they are the second most important domestic food crop (after cassava) of the Belgian Congo and Ruanda-Urundi. Practically all plantains are used for home consumption or for domestic sale within the area and almost all are grown by Africans.

In 1958, 4,187,000 short tons of plantains were produced on 1,050,000 acres. They are grown most intensively in Ruanda-Urundi and in Oriental and Equator Provinces, for while they will grow in a wide belt 30 degrees on each side of the Equator (such a belt covers most of Africa), they are somewhat demanding about growing conditions. The plants need good soils, an average annual temperature of about 68°F., annual rainfall of about 40 inches evenly and

gently distributed throughout the year, full sunshine, no frosts, and no strong winds. Because plantains require rich soils, Africans plant them in preferred positions near their dwellings, where the soil is constantly enriched by refuse of all kinds. Also, they are planted first after clearing dense forests, when the soil is most fertile.

Plantains are rather unusual plants, with no authentic stem or trunk. From a long-lived root grow great leaves which form a sheath or pseudo-trunk. From inside this leaf sheath comes a long flower stem. The flower stem bears male flowers on the end, mixed flowers in the middle, and female flowers at the base. The female flowers develop into the actual plantain fruits. A row of fruits is called a hand. All the fruits on a plant are called a bunch.

Propagation is by means of shoots taken from an old clump of rhizomes. The rhizomes themselves may also be used as planting material. Africans usually burn new ground before planting plantains, which they may grow mixed with cassava or rice.

Each plantain "tree" that comes up bears only one bunch. However, new rhizomes are formed at the same spot and as many as three plantain "trees" may be in various stages of growth at the same spot at the same time. The life of one stool, or clump of rhizomes, may be 10 years or longer.

A bunch of plantains matures in from 8 to 18 months after growth begins. Plantains are cut 4 to 8 days before eating. Being quite starchy, they must be cooked before eating. They are also used in making native beer.

Table bananas carry the scientific name Musa sapientum. Most of those grown in this area are of the Gros Michel variety. About 61 percent are grown by Europeans. About 68 percent of the total table banana crop in the commercial area is exported.

Table bananas are grown mostly in Leopoldville and especially in the Mayumbe--that area lying north of the Congo River near the Atlantic Ocean. Growing conditions and natural growth of banana plants are the same as for plantains.

European planters of commercial banana plantations usually clear only the undergrowth before planting shoots. Once the bananas are growing well, the remaining trees of the forest are cut. The humid, hot atmosphere under the banana leaves assists in rotting the unwanted logs.

Harvesting of table bananas for export requires a keen eye to discern the exact degree of immaturity desired. Cut too soon, the bananas will not ripen; cut too late, they will ruin before reaching the overseas customer. Export bananas are cut as much as 3 weeks before expected delivery to the customer. They are loaded on to ventilated ships as bunches and sent to Belgium and other customer countries.

Pyrethrum.

Introduced into the Belgian Congo only in 1931, pyrethrum (an insecticide) has become a valuable specialty crop for export. The Belgian Congo and Ruanda-Urundi are the fifth largest producer of pyrethrum, after Japan, Yugoslavia, Italy, and Kenya.

In this area, most pyrethrum is grown in Kivu Province and in Ruanda-Urundi, and most is grown on European plantations, even in Ruanda-Urundi where Africans grow nearly all the crops.

Pyrethrum is a member of the chrysanthemum family and looks like a black-eyed Susan. One species, Chrysanthemum cinerariaefolium, which originated in Dalmatia (Yugoslavia), has a high proportion of the active ingredient, pyrethrine, and is economically attractive for that reason.

Pyrethrum plants can stand extremes of heat and cold, but prefer bright sunlight and altitudes of 5,900 to 6,600 feet, or higher. Light, permeable, well-drained, well-pulverized soils of volcanic origin are best for pyrethrum. It can be propagated with seed or with pieces of stump. However, after several generations of vegetative reproduction, the pyrethrine content begins to decline. For this reason, seed-grown plants are preferred.

Seeds can be planted in seedbeds and later transplanted to the fields or planted broadcast or in rows in the fields. Once field growth starts, the plants need to be kept cultivated and hoed clean of weeds, especially the harmful couchgrass.

In Kivu, pyrethrum flowers from August to May. All stages of flowering may be found in the same field. Flowers must be cut several times. Immediately after cutting, the flowers, which contain most of the active ingredient, are dried until moisture content is reduced to about a fourth. The dried flowers are compressed into bales of about 440 pounds for shipment.

Pyrethrum flowers keep poorly. The active ingredient, 1.1 to 1.8 percent of the weight of dry flowers, tends to decline on exposure to heat, humidity, light, and air. Ironically, the stored flowers of this insecticide are subject to depredations of various insects, especially thrips.

Pyrethrum has the unusual quality of being nontoxic to humans and warm-blooded animals while still having quick killing powers for a number of insects, including lice, bugs, fleas, mosquitoes, flies, caterpillars, plant lice, ants, and cockroaches. It is also used in making ointments for treatment of scabies (the itch).

Demand for pyrethrum is always strong. Despite competition from synthetic chemical insecticides, pyrethrum production in the world and in this area is likely to increase in the years ahead.

Quinine.

Quinine, used mostly for treatment of malaria, is another valuable

specialty crop of this area. It is produced from the bark of cinchona trees, grown mostly in Kivu Province, with smaller numbers in Ruanda-Urundi and in Oriental Province.

Cinchona trees (Cinchona ledgeriana) grow best between 3,300 and 6,600 feet altitude. They need abundant rainfall, high humidity, and some shade from direct sunlight. Soils for cinchona trees should be deep, permeable, and coherent, preferably sloping and well drained.

Cinchona trees are usually grown from seed in nurseries and transplanted to start the young groves. At about 3 years of age the stand is thinned and the remaining saplings pruned. The bark from these thinnings and prunings is the first harvest. The cinchona planter continues to thin and prune his grove and thus has a harvest every year.

When the grove is about 12 years old, the planter digs up the trees and harvests the bark from roots, trunks, and branches. The bark contains the essential ingredient Q.A.A. (Quinine Alkaloid Anhydrous). In the Kivu, bark from the trunk of 10-year-old trees contains $9\frac{1}{2}$ percent Q.A.A., that from the roots 7 percent, and that from the branches 6 percent.

Exports are made both in the form of bark and as salts extracted from the bark.

The future of quinine in this area is difficult to predict. After World War II, plantings were made rapidly, reaching a peak of 18,000 acres in 1953. The area declined over a half by 1958 to 8,500 acres. Some cinchona growers have planted coffee. Among factors to be considered are competition from synthetic antimalarial drugs which have less harmful side effects than quinine, competition from other cinchona processing areas (especially Indonesia), and eradication of mosquito-infested areas (thus reducing the need for quinine).

Corn.

Corn is the most important cereal grown in the Belgian Congo and Ruanda-Urundi. Land in corn is about equal to the combined acreage of other cereals. Production is just over 4 percent of that for Africa as a whole and about one-fourth of 1 percent of world production.

In this area, corn is generally planted in small patches in the highlands and savannas, and used as food by the Africans. INEAC has done some work in producing corn hybrids, but most corn is planted with open-pollinated seed of native varieties. Practically all the soil preparation is done by hand with no tool but a hoe. Corn is often interplanted with other crops.

Africans find the "green," immature ears of corn to be a great delicacy as a vegetable, whether boiled or roasted in the ashes. This means that harvest of the crop can begin early. When the remaining ears are dry, they are pulled from the stalk and stored. The Africans prefer to store their corn with the shuck on for use as needed for food. It is ground into meal or grits (semoules). Little corn is used as livestock feed.

A few thousand bushels of corn are shipped each year, chiefly to Belgium and the Netherlands. There is considerable internal trade in corn, especially toward the urban centers of Leopoldville and Elisabethville.

Rice.

In this area, rice is mostly an upland, unflooded crop. Some rice is flooded, especially in the Usumbura area. It is a secondary food crop grown by Africans, chiefly in Oriental, Equator, Kivu, and Kasai Provinces. Considerable rice enters into internal trade and a small amount is exported.

Upland rice can be grown where there is as little as 30 inches of rainfall per year. Since rice has a short growing season, it is possible to raise two crops on the same land in 1 year.

Africans do not plow rice land but dig shallow seed-holes at 8- to 16-inch intervals, planting seven grains of paddy rice in each hole. Often rice is interplanted with corn, sesame, cassava, or bananas. The young plants are weeded twice within 2 months, by which time the plants cover the ground.

Maturity comes 4 to 6 months after seeding. The heads of rice are pulled off by hand and dried in the sun for several days. After threshing, the paddy (unhulled rice) is dried further in the sun. If intended for eating at home, the rice is hulled by beating or stamping. If intended for commerce it is sold as paddy to a rice mill, where the hulling is done mechanically.

Rice is considered a luxury food; it is being replaced by wheat bread in the cities. The acreage in rice is expected to remain about constant or even fall off a bit.

INEAC and the Anti-Erosion Mission have experimented successfully with flooded rice, and acreage in such rice may reach significant porportions in time.

Beans and Peas.

Beans and peas make a valuable contribution to the diet of both Africans and Europeans. The 1,387,000 acres in these vegetables in 1958 was second only to the acreage in cassava. In weight of product, the 483,000 short tons of beans and peas was in fifth place, after cassava, plantains, sweetpotatoes, and corn. Average yield of beans and peas was 696 pounds per acre in 1958.

The areas of concentration for beans and peas are Ruanda-Urundi and the eastern highlands of the Congo. A large variety is grown, some kinds familiar only to central Africa, others known in Asia, Europe, and the Americas. Some produce food in the leaves and tubers as well as in pods. Some grow as vines and some as bushes. Some are annuals; others are longer lived. Among the kinds grown are:

Green beans, common to Europe and the United States; lima beans; mungo beans, an indigenous plant with long pods; spanish beans, a long-lived climber; dolichos lablab, a wild bean which is cultivated when it comes up volunteer around African huts or on the edges of banana plantations; dolichos bulbosus,

producer of edible tubers as well as bean pods; kunde beans, known in Ruanda-Urundi as "Nkole;" adzuki beans, recently introduced from the Orient by INEAC; pigeon peas (Cajan pea), a widely grown pea with a delicious flavor, relished by both Africans and Europeans; common garden peas, long grown in areas near the Great Lakes (Albert, Edward, Kivu, and Tanganyika); saber peas; square peas (the leaves, tubers, and peas are all edible).

Most beans and peas are used for home consumption. About a third of those grown in the Congo proper enter into domestic and foreign trade.

Sweetpotatoes.

By weight, this familiar crop takes third place, after cassava and plantains. In 1958, a crop of 1,619,000 short tons was dug from 538,000 acres.

In the eastern highlands of the Belgian Congo and in Ruanda-Urundi, sweetpotatoes fill the role played by cassava in other parts of the Congo. They are rich in starch, with a desirable sweet flavor, but are poor in proteins.

Sweetpotatoes thrive in warm humid areas. They need light, friable soils which will permit the roots to grow easily underground. Soils with only a moderate amount of nitrogen are desired, as too much nitrogen stimulates leaf growth instead of root production.

The roots, which may weight 1 to 7 pounds each at maturity, are harvested by digging from the ground with hoes. Once out of the ground, they keep better than cassava.

Africans eat sweetpotatoes boiled, fried, or braised. The roots can also be used for making starch, syrup, and alcohol. The leaves can be eaten as a green vegetable.

Grain Sorghum.

Grain sorghum is an important food crop for Africans, particularly in Ruanda-Urundi, and to some extent in the higher and drier areas on the eastern edge of the Belgian Congo.

As compared to corn, grain sorghum thrives on poorer soils, less rainfall, and higher temperatures. In certain regions, no other food plant can replace it. Sorghum may be planted broadcast but it is preferable to plant the seed in hills in rows. Harvesting is done by hand 3 to 5 months after planting. The grain, made into flour and beer, is an excellent food for humans, being richer in proteins (especially albuminoids) than corn.

Sugarcane.

Sugarcane is important, not as an export crop, but for supplying a large part of the domestic market for sugar. This saves foreign exchange and transportation facilities.

All the commercial sugar is grown on two widely separated plantations, each served by a sugar mill. One large plantation and mill are at Moerbeke-Kwilu, 109 miles from Leopoldville. A new plantation and mill are located in the Ruzizi Valley on the border between the Belgian Congo and Ruanda-Urundi. In addition, Africans throughout the area grow a few stalks per farm for chewing.

Stumps of cane left after harvest sprout again and produce a new crop without being replanted or moved. The succeeding crops are smaller, however. In the Congo, the growers are content with three regrowths; that is, four crops in all from one planting.

At Moerbeke-Kwilu, the Compagnie Sucriere Congolaise has mechanized part of its operations, especially the lifting and hauling of the heavy stalks of cane.

Tobacco.

Production of tobacco is small but may be the beginning of large commercial crops in the future. Tobacco for home use is grown throughout the area. Most villages have a few stalks or a small patch growing nearby. Fields of some commercial importance grow in Kasai and Katanga Provinces and in Ruanda-Urundi. Dark air-cured is the favorite variety, with some light air-cured (burley) and a little cigar wrapper, binder, and filler.

Some tobacco is sold to Congo tobacco factories and a small amount is exported. On the other hand, 6,200 short tons of unmanufactured tobacco were imported in 1958.

Other Crops.

Among other crops grown for export may be noted perfume plants, castorbeans, and sisal.

Perfume plants grown include rose geranium, eucalyptus, and lemongrass. The plants are distilled and exported as essential oils for use in perfume, soap, and medicine.

In recent years, the castorbean crop has been exported as beans, although in earlier years a good part of the crop was crushed locally and exported as castor oil and oilcake.

Sisal is a rough fiber plant used for rope, door mats, bags, and tarpaulins.

A number of domestic food crops are grown in addition to those already described. Among them are such Temperate Zone crops as Irish potatoes and wheat and oil crops such as sesame and soybeans. Millet, with a production of 31,000 short tons in Ruanda-Urundi alone, is a food crop of some significance. Various other fruits, nuts, and vegetables are also used for food.

TABLE 4.--Livestock: Inventory on December 31 and slaughter for year, Belgian Congo and Ruanda-Urundi, 1958

Species	Inventory	Slaughter
	1,000 head	1,000 head
Cattle	2,017	232
Hogs	415	148
Sheep	1,311	218
Goats	3,697	740

Livestock and Livestock Products.

In spite of the rather large numbers of livestock (especially cattle) found in the Belgian Congo and Ruanda-Urundi, they are more of social than economic importance. Most cattle owned by Africans are kept for their prestige value and to trade for wives, and play only a minor role in the money economy. However, cattle raising by Europeans in the Belgian Congo proper may be considered an economic farming operation; in 1958, Europeans owned 47 percent of the cattle there.

Most of the sheep, goats, and hogs are kept by Africans (both in the Congo proper and in Ruanda-Urundi). Sheep and goats are widely used for trading for wives. Some of these animals (as well as hogs) are slaughtered for food for home use.

The area does not supply its own needs for meat, dairy products, and other livestock products.

Several tick-borne diseases cause serious losses to all kinds of livestock. However, the government's Veterinary Service has made considerable progress in spraying or dipping animals at regular intervals to eliminate ticks. Some large operators in the Belgian Congo have started spraying or dipping on their own initiative.

Cattle.--Despite their great differences in land area, in 1958 the Belgian Congo and Ruanda-Urundi shared the cattle almost equally. The Congo had 1,006,000 cattle and Ruanda-Urundi 1,011,000 head.

Most of the cattle are of African breeds brought in with the migrations from the north and south many years ago. The main African breeds are the Ankole, Nioka, and Lugware. The animals are small, hardy, and fairly resistant to diseases. Many have Zebu or Brahma characteristics. In Ruanda-Urundi most of the cattle are longhorn breeds of several types. There are some cattle of each of the European dairy breeds.

Cattle graze on savanna in Ruanda-Urundi. Here cattle are symbol of prestige and wealth; but in Congo proper, half are commercially important. Van Sinay, Rudipresse

The small N'Dama cattle of West Africa have been introduced into Leopoldville Province. They are generally kept in European-managed herds on plantations, missions, and farms and are raised primarily to supply meat to the local population.

Most cattle depend on natural grasslands. Additional or reserve feed supplies are rarely provided. In areas with a dry season, cattle thrive during the rainy seasons when grass is plentiful but lose weight during the dry months when it is scarce. There are no extensive movements of cattle in search of better pasture. The cattle are grazed during the day but are driven into an enclosure at night for protection against wild animals.

At least 5 large companies in the Belgian Congo own herds of more than 20,000 cattle each. Some other companies, as well as some church missions, own herds numbering in the thousands. Cattle herds of Africans usually range from 1 to 5 animals.

In addition to meat, some milk, butter, and cheese are produced. Some tribes regularly bleed their Ankole cows, using the blood as part of their diet.

Practically no cattle are used as draft animals, either for plowing or for hauling.

TABLE 5.--Cattle: Number, by political region and national origin of owner, Belgian Congo and Ruanda-Urundi, 1958 1/

Political region	Ownership		Total	Percent of total
	European	African		
	1,000 head	1,000 head	1,000 head	Percent
Belgian Congo:				
Leopoldville	107.6	15.9	123.5	6
Equator	28.8	3.0	31.8	2
Oriental	64.1	309.7	373.8	19
Kivu	17.9	196.5	214.4	11
Katanga	176.6	8.1	184.7	9
Kasai	73.8	3.6	77.4	4
Total	468.8	537.0	1,005.8	50
Ruanda-Urundi	2/ 3.2	1,008.1	1,011.3	50
Grand total	472.0	1,545.1	2,017.1	100

1/ Some columns do not add because of rounding. 2/ 1957.

INEAC does some work in cattle improvement at its station at Nioka. Cattle imports, largely for breed improvement, averaged 3,200 head annually for the period 1953-56. Imports were mostly from Southern Rhodesia, Kenya, and the Union of South Africa. Most cattle brought in from the Union were of the Africander breed.

In the past, the presence of the tsetse fly, carrier of trypanosomiasis, has discouraged cattle raising in the Belgian Congo. However, the fly has been largely eradicated from the savannas and is considered a pest only in the heavy forests. Also, vaccines have been developed which are officially claimed to produce an immunity to the disease.

Ruanda-Urundi is also infested with tsetse fly. However, the fly has not been as much of a deterrent to cattle raising as in the Belgian Congo proper.

Hogs.--Most hogs are found in the Belgian Congo proper. Nearly all are of native, unimproved stocks producing low-quality meat. A few pedigree hogs have been imported by experiment stations and plantations for upgrading herds.

Almost 89 percent of the hogs are owned by Africans who keep one or two sows which are allowed to roam around the village and feed on refuse. Except on European plantations, supplemental rations are rarely fed.

Sheep.--Practically all sheep are of a small, indigenous type raised for meat and skins. No wool is produced for the market. In fact, most of the sheep in the Belgian Congo and Ruanda-Urundi do not grow wool but are covered with hair like that of goats. Most flocks contain no more than three or four sheep. Over 98 percent are owned by Africans.

Goats.--The 3,697,000 goats are widely distributed over the entire area. They are of a small, native type raised for meat and milk. All but about one-tenth of 1 percent are owned by Africans, mostly in herds of 1 or 2 does with offspring.

Horses, Mules, and Donkeys.--These animals can almost be numbered in the hundreds. In 1956, European farmers reported only 1,668 horses in the Belgian Congo and 52 in Ruanda-Urundi. They had some mules in the Congo and 2 (only) in Ruanda-Urundi. They had 400 donkeys in the Congo and 59 in Ruanda-Urundi.

It is not known how many horses, mules, and donkeys are found on African farms, but it is certain that their number is negligible.

Transportation

One of the greatest hindrances to the development of agriculture is the lack of adequate transportation. The Congo River and its tributaries are the main means of freight movement. The rail system is far from forming a complete network. There are only a relatively few miles of paved roads and much of the unpaved road system is impassable in wet weather.

As a result, exports of farm products are largely limited to nonperishable products which can be shipped in bags, bales, or steel drums. Domestic and export trade in such perishable farm products as milk, fresh meat, and fresh fruits and vegetables is almost impossible. Bananas are a notable exception; they are grown in the western part of the Belgian Congo and loaded directly from rail cars onto ocean vessels.

Roads.

In 1956, the Belgian Congo proper had a total of 86,402 miles of roads, of which 20,572 miles were principal roads, 56,134 were secondary, and 9,696 miles were private.

Local transportation in Ruanda-Urundi is dependent entirely on 5,430 miles of roads. Of this amount, 214 miles are rated as principal roads, 1,414 as secondary roads, and 3,802 miles as local roads or "tracks."

Paved roads exist for the most part only in cities and nearby, but some intercity construction is now under way. The most important paved links are the roads connecting Tshela and Boma, Elisabethville and Kipushi, and Bukavu and Usumbura. Hard surfacing of some other roads is in progress or projected.

Other highways connecting cities or industrial areas are sand, gravel, or laterite. Many of the principal roads in the eastern Belgian Congo and in Ruanda-Urundi are fairly good. Most other dirt roads in the Belgian Congo

range from fair to bad. The government, under its long-term highway program, has improved various heavily traveled sections and is scheduled to continue this program.

Despite the roughness and muddiness of many roads, they are an indispensable link in getting crops to market by motor truck.

Railroads.

In the Belgian Congo, five companies operate 2,879 miles of railway. In the United States, the Atlantic Coast Line Railway operates almost twice as much railway line and the Burlington System almost four times as much.

Ruanda-Urundi has no railroad.

The railroads of the Belgian Congo were built to supplement the river transportation system. Some stretches are only portage lines to carry freight around river rapids. Such lines include railroads from Matadi to Leopoldville, Stanleyville to Ponthierville, and Charlesville to Makumbi. One line north of the Equator runs from Bondo to Mungbere via Aketi. It does not connect with any other rail line.

South of the Equator an elementary rail network exists. A railroad runs from Port Francqui (on a Congo tributary, the Kasai River) through Luluabourg, Kamina, Tenke, Jadotville, and Elisabethville to the Rhodesian border. Another connects Albertville on Lake Tanganyika with Kindu on the Lualaba River (a Congo tributary). This line has recently been tied to the Port Francqui - Elisabethville line by the new "K to K" railroad (Kabalo to Kamina).

From Tenke, a line runs west to make connections with the Portuguese Angola railroad at the border; the Angola railroad reaches the Atlantic Ocean at Lobito.

At the Rhodesian border south of Elisabethville, the south Belgian Congo rail system makes connections with the rail lines of Rhodesia, Portuguese Mozambique, and the Union of South Africa.

Far to the west, an unconnected 87-mile railroad runs due south from Tshela to the port of Boma.

Rivers and Lakes.

The Congo River and its tributaries form the main transportation artery of the Belgian Congo, although numerous rapids cause laborious, expensive portaging either by railroad or by road.

In January 1957 the large commercial river fleets had a capacity of 275,175 short tons; considerable expansion was planned. In addition, there are some large boats owned by big corporations and a number of small individually operated ones. Principal river ports are Leopoldville, Stanleyville, Coquilhatville, and Port Francqui. All have been enlarged and improved in recent

years.

Lake steamers on Lake Tanganyika are of considerable importance in moving farm products from Ruanda-Urundi. Freight loaded on steamers at Usumbura, Ruanda-Urundi, is unloaded on the eastern shore at Kigoma, Tanganyika, for rail shipment to Dar es Salaam on the Indian Ocean. Or such freight may be unloaded on the other shore of the lake at Albertville, Belgian Congo, for shipment by rail-river routes to Matadi or by rail to Elisabethville and connections.

Ports.

Within the Belgian Congo itself, only Matadi and Boma, on the lower Congo River, are equipped to handle ocean vessels and general cargo. These ports have modern equipment and warehouses and can handle 10,000-ton ships alongside the docks.

Chief ports used by the Belgian Congo and Ruanda-Urundi and exports of Belgian Congo and Ruanda-Urundi products made through them in 1958 were as follows:

	1,000 short tons
Matadi (Lower Congo River):	
Vegetable oils	218
Oil cake	92
Coffee and tea	47
Rubber	38
Cotton	35
Minerals	181
Wood	72
Other	102
Total	785
Ango-Ango (Lower Congo River):	
Vegetable oils	11
Other	1
Total	12
Boma (Lower Congo River):	
Various seeds, plants, and fruits (including palm kernels)	28
Fruits (including bananas)	27
Vegetable oils	17
Cocoa	2
Rubber	1
Wood	61
Total	136
Pointe-Noire (Congo Republic):	
Minerals	33
Lobito (Angola):	
Cotton	4
Minerals	470
Other	5
Total	479
Mombasa (Kenya):	
Coffee and tea	7
Seeds and fruits	(1/)
Total	8
Dar es Salaam (Tanganyika):	
Coffee	23
Hides and skins	1
Castorbeans	(1/)
Minerals	2
Other	6
Total	32
Beira (Mozambique):	
Minerals	100

1/ Less than 500 short tons.

Ocean freighter service from the Belgian Congo's own ports of Matadi and Boma is excellent. Freighters sail to and from Belgium, the United States, and other countries on regular schedules. Most freighters also carry passengers and there are weekly passenger ships to Antwerp. Tramp freighters and tankers also call at the lower Congo River ports.

Air Service.

Air freight is important in shipment of fresh beef from Chad territory of French Equatorial Africa (now the autonomous Republic of Chad) to the Belgian Congo. In 1958 an estimated 1,300 short tons of fresh beef was imported from Chad, most of it arriving by air.

Marketing

Export Crops.

The Government of the Belgian Congo plays an important role in the marketing of export crops. This takes the form of concessions, semi-governmental companies, government-sponsored cooperatives, minimum wages for some workers, price fixing, and encouragement of processing within the Congo.

That coffee from the area is handled by several big cooperatives or agencies has already been pointed out. As other examples, these are the marketing methods and channels for palm produce and cotton.

Palm produce marketing is bound up with the concession system. Under this system, the concessionaire can exploit the wild palm trees growing in a specified area, provided an oil mill is set up to process the fruit. In such areas the African population can continue to pick the crop and keep what it requires for its own use but cannot sell fruit to anyone except the concession holder, who, in turn, is obligated to buy all the fruit offered to him.

Sale of palm produce overseas is not ordinarily a problem, as many of the largest concessionaires produce for their own factories overseas.

As for cotton, as long ago as 1949, 12 companies and 1 individual were licensed to purchase, gin, and export it in the Belgian Congo and Ruanda-Urundi. The 12 companies are backed by Belgian and Dutch capital. The key firm in the Congo cotton economy is COTONCO.

Domestic Crops.

Crops intended for consumption within the area are generally sold at African markets, along with a variety of other consumer goods. Such a market usually consists merely of a large open field where sellers may spread their goods on the ground. In a smaller center there may be a shed for meat sellers. A city market place usually has some simple buildings. The African market has no obvious form of organization. Scores of small sellers group their wares on the ground around them and clamor for the attention of the prospective buyers who walk among them.

In most areas, a number of local markets operate 1 or 2 days a week. A larger central market in the area operates 2 or 3 times a week. Sunday is the big market day. The local markets and the central market are usually held on different days, so that sellers and buyers may patronize one or all according to their wishes. It is not unusual to find a central market located near permanent retail stores operated by Arabs, Greeks, or Portuguese, depending on the area.

In surplus food-producing areas, the markets are attended by non-Africans who buy locally grown foods which they transport to towns and cities for resale.

Commodities for export are seldom sold and bought at the African markets.

International Trade

Exports.

Agricultural products make up about a third to a half of the value of all exports. In 1958 the proportion was 41 percent, but it fluctuates widely from year to year, not so much because of changes in agricultural exports as of quantity and price fluctuations of copper, other minerals, and diamonds. While some farm products (such as coffee) are in world surplus and others (such as vegetable oils) meet strong competition in the world market place, the Congo's farm products rarely fail to find buyers. Careful grading of coffee and other products and local processing of palm kernels and other oilseeds add to the value of products exported and thus increase the export income.

Photograph by Lebied, Congopresse
Tapping rubber tree, Belgian Congo.

The Big Four of Congo's agricultural exports are coffee, palm produce, cotton, and rubber.

Coffee (both Robusta and Arabica varieties) made up the largest single agricultural export in 1958, totaling $56.3 million, or 14 percent of total exports.

Palm produce (palm oil, palm kernels, palm kernel oil, and palm kernel cake), with a value of $54.5 million, or 13 percent, took second place.

Third place was filled by cotton (lint, seed, cottonseed oil, and cottonseed cake), with an aggregate value of

$24.3 million, or 6 percent of the total.

Rubber was the fourth most valuable export in 1958, with a value of $17.0 million, or 4 percent of the total.

TABLE 6.--Principal agricultural commodities: Quantity and value of exports, 1956-58

Commodity	1956		1957		1958	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
Coffee	56.4	44,540	73.9	58,340	79.0	56,312
Palm produce:						
Palm oil	166.4	32,920	171.5	34,479	181.4	33,515
Palm kernel oil	48.7	10,120	60.2	12,749	63.8	13,598
Palm kernels	38.8	4,100	33.8	3,545	42.1	4,415
Palm kernel cake	51.7	2,760	60.8	3,006	68.4	2,952
Cotton:						
Lint cotton	55.9	36,320	43.4	25,740	39.5	21,547
Cottonseed oil	7.3	1,860	7.3	1,909	6.4	1,411
Cottonseed cake	26.9	1,880	27.8	1,807	27.2	1,335
Rubber	35.8	20,700	37.8	20,371	38.7	16,989
Cocoa beans	4.6	2,400	5.4	2,468	5.3	4,005
Cassava flour	22.3	1,320	17.2	931	45.3	2,439
Peanuts:						
Peanut oil	8.2	2,480	7.3	2,046	6.8	1,552
Peanut cake	9.9	720	9.6	627	9.0	465
Urena, punga, and similar fibers	3.9	880	4.4	1,054	7.4	1,667
Tea	1.4	1,140	2.3	1,614	2.6	1,586
Bananas	42.7	1,560	40.0	1,465	31.4	1,149
Pyrethrum:						
Extract 1/	(2/)	213	(2/)	700	(2/)	633
Flowers	1.6	1,051	1.1	737	.4	295
Quinine bark	1.5	540	1.8	621	2.6	904
Hides and skins	1.2	860	1.2	785	1.1	754
Corn	2.9	170	15.7	698	16.6	659
Rice	1.1	138	2.1	235	1.4	160
Essential oils	.1	200	.1	159	.1	135
Other agricultural	--	4,181	--	2,736	--	1,689
Total agricultural	--	172,840	--	178,122	--	169,533
Nonagricultural	--	369,280	--	301,057	--	242,092
Grand total	--	542,120	--	479,179	--	411,625
Agricultural exports as percent of total exports	--	Percent 32	--	Percent 37	--	Percent 41

1/ Pyrethrum extract is classified as nonagricultural and is not included in total agricultural exports. 2/ Less than 50 short tons.

The Belgian Congo's almost land-locked position makes difficult a fair presentation of exports by destinations. Shipments are shown in the Belgian Congo Government trade tables prepared in Leopoldville as going to the ports of Mombasa, Kenya; Dar es Salaam, Tanganyika; Beira, Mozambique; and Lobita, Angola, without correction to show their ultimate destination. Furthermore, data on shipments going to Belgium are sometimes misleading, as much produce is transshipped to other countries without being processed or manufactured in Belgium.

Data published by la Banque Centrale du Congo Belge et du Ruanda-Urundi (Central Bank of the Belgian Congo and Ruanda-Urundi) are adjusted to correct these two types of errors. Main estimations of the chief agricultural products, as corrected by the bank, are shown below, for 1958.

	Percent		Percent
Coffee:		Rubber:	
United States	49	United States	26
Belgium	17	Belgium	23
Italy	17	France	16
		Netherlands	11
Palm oil:			
West Germany	23	Cocoa beans:	
Belgium	22	Netherlands	48
Netherlands	14	Belgium	26
United States	10	West Germany	15
Palm kernel oil:		Peanut oil:	
United States	40	Belgium	84
West Germany	23		
Italy	13	Urena and punga:	
		Belgium	76
Palm kernels:		West Germany	23
Belgium	65		
West Germany	12	Tea:	
Netherlands	11	United Kingdom	47
		Netherlands	14
Lint cotton:			
Belgium	39	Bananas:	
West Germany	23	Belgium	30
Netherlands	18	Netherlands	29
Cottonseed oil:		Pyrethrum flowers:	
Belgium	58	United States	92
Austria	16		
United Kingdom	14	Oil cakes:	
		West Germany	58
		Denmark	19

Imports.

Imports of agricultural products are mostly foods for city consumption, plus beer, wine, and unmanufactured tobacco, and in 1958 amounted to about 11 percent of all imports (agricultural and nonagricultural). Wheat flour, meat,

unmanufactured tobacco, milk, malt, and beer and wine were the chief imports in 1958. Belgium was the chief supplier, followed by the United States and the Union of South Africa.

TABLE 7.--Principal agricultural commodities: Quantity and value of imports, 1956-58

Commodity	1956		1957		1958	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
Wheat flour	34.5	4,560	40.3	5,211	39.4	5,280
Meat, fresh and dried	11.0	5,200	11.6	5,377	8.5	4,346
Tobacco, unmfd.	4.4	2,660	6.4	3,639	6.2	3,567
Milk, fresh, canned, and dried	5.7	3,180	8.4	2,567	8.3	3,080
Malt	18.8	2,680	22.6	3,324	19.7	2,776
Beer and wine	14.8	3,860	14.7	2,803	9.3	2,072
Sugar and sugar products	10.9	1,880	11.8	1,961	9.6	1,694
Meat preparations	2.5	2,040	3.3	2,170	2.1	1,517
Fruits, fresh, dried, and canned	5.7	1,420	6.7	1,744	7.1	1,507
Butter	2.0	2,020	2.1	1,763	2.1	1,345
Cheese	1.1	1,160	1.4	1,241	1.5	1,260
Potatoes, white	12.0	880	14.0	1,011	13.2	1,058
Beans and peas, fresh and dried	5.7	860	5.7	861	4.9	859
Hops	.3	720	.6	1,264	.2	754
Other agricultural	--	7,780	--	7,511	--	5,932
Total agricultural	--	40,900	--	42,447	--	37,047
Nonagricultural	--	361,500	--	383,520	--	313,620
Grand total	--	402,400	--	425,967	--	350,667
Agricultural imports as percent of total imports	--	Percent: 10	--	Percent: 10	--	Percent 11

On a percent of value basis, the following table shows the chief imports and chief countries of origin in 1958:

	Percent		Percent
Wheat flour:		Meat preparations:	
United States	72	Belgium	22
Canada	16	Netherlands	22
		Argentina	18
Meat, fresh and dried:		Denmark	12
Union of South Africa	27		
Belgium	23	Fruits, fresh, dried, and canned:	
French Equatorial Africa	19	Union of South Africa	62
Southern Rhodesia	13	Belgium	16
Kenya	10		
		Butter:	
Tobacco, unmanufactured:		Denmark	32
United States	46	Kenya	19
Italy	17	Belgium	18
Nyasaland	17	Union of South Africa	13
		Netherlands	12
Milk, fresh, canned, and dried:			
Netherlands	40	Cheese:	
Denmark	35	Belgium	27
Belgium	17	Netherlands	21
		Switzerland	16
Malt:		France	11
Belgium	55		
United States	20	Potatoes, white:	
Czechoslovakia	19	Belgium	51
		Union of South Africa	18
Beer and wine:		Portugal	17
Portugal	44	Angola	10
France	30		
		Beans and peas, fresh and dried:	
Sugar and sugar products:		Angola	52
Belgium	72	Belgium	34
		Hops:	
		Czechoslovakia	59
		West Germany	28

Trade with the United States.

Exports from the Belgian Congo and Ruanda-Urundi to the United States are quite important, amounting to 25 percent of agricultural exports in 1958.

TABLE 8.--Agricultural commodities: Value of exports to the United States and percent of total, 1958

Commodity	Value	Exports to U.S. as percent of total exports
	1,000 dollars	Percent
Coffee	27,846	49
Palm kernel oil	5,478	40
Rubber	4,458	26
Palm oil	3,234	10
Pyrethrum extract 1/	580	92
Hides and skins	310	41
Pyrethrum flowers	272	92
Tea	70	4
Essential oils	5	4
Total	41,673	2/ 25

1/ Pyrethrum extract not included in total.
2/ Percent of total agricultural exports.

The Belgian Congo and Ruanda-Urundi buy wheat flour, unmanufactured tobacco, malt, and a host of other agricultural products from the United States. While the total value was only $6.6 million in 1958, it amounted to 18 percent of the Congo's total agricultural imports.

TABLE 9.--Agricultural commodities: Value of imports from the United States and U. S. share of market, 1958

Commodity	Value	U. S. share of market
	1,000 dollars	Percent
Wheat flour	3,816	72
Tobacco, unmanufactured	1,644	46
Malt	563	20
Cereals and byproducts, except wheat.	137	31
Sugar and sugar products	101	6
Fruits, fresh, dried, and canned.	100	7
Milk, fresh, canned, and dried	76	2
Meat preparations	62	4
Hops	46	6
Butter	12	1
Biscuits	10	2
Cheese	8	1
Meat, fresh and dried	8	(1/)
Beans and peas, fresh and dried	5	1
Beer and wine	3	(1/)
Vegetable oils	2	1
Total	6,593	2/ 18

1/ Less than one-half of 1 percent. 2/ Percent of agricultural imports.

Trading Companies.

A great deal of foreign trade of the Congo is handled by large general trading companies with headquarters or buying offices or both in Brussels. At least one trading company has headquarters in the Netherlands. The companies have extensive organizations throughout the Congo which permit them to sell wholesale to a network of small independent traders, to sell retail (mostly to Africans), and to buy produce for export. This multiplicity of interests for an individual firm is highly characteristic of commerce in the Congo.

However, the World War II prosperity and postwar boom encouraged a great many new companies to enter the export-import field. They were joined in such foreign trade operations by a number of companies which had formerly operated only as wholesalers. These newer companies usually operate from headquarters in the Congo itself and tend to specialize in certain products or lines.

Trade Balance.

The Belgian Congo and Ruanda-Urundi have no problem in meeting their foreign exchange requirements. Exports regularly exceed imports. In 1957 the export surplus was $53 million and in 1958 it amounted to $61 million.

The Belgian Congo franc (worth 50 to the U. S. dollar) is closely pegged to the Belgian franc and, like it, can be considered a hard currency.

Government Policy for Trade.

Theoretically, and to a large degree in practice, the Belgian Congo and Ruanda-Urundi are an open market for the entrepreneurs of the world. Under the terms of the Congo Basin Agreement, the area cannot impose preferential tariffs against signatories of this agreement--the United States, Belgium, the United Kingdom, France, Italy, Japan, and Portugal. The Congo Basin Convention covers the area drained by the Congo River plus other specified territories extending to the Indian Ocean.

In actual practice, the Belgian Congo and Ruanda-Urundi are not quite the free markets they seem to be. Imports, except those originating in Belgium, are subject to licensing. The importer must apply for a license which, in normal circumstances, is automatically granted. Licenses are sometimes denied, however, because of overstocking of the market to the detriment of local interests. The control of trade with Belgium is in the hands of the Belgian Government, which does not always place restrictions on exports to the area when the Belgian Congo and Ruanda-Urundi authorities are restricting imports from other sources. However, Belgian goods receive no preferential tariff treatment.

The European Common Market, which includes Belgium, West Germany, the Netherlands, Italy, France, and Luxembourg, as well as the colonies of these countries, is not expected to have a marked effect on Congo agricultural exports. Except for the United States, the Congo's best customers are the five larger members of the Common Market.

Production.

Prospects for expansion of agricultural production appear excellent, especially in the Belgian Congo proper. There is much land which can be planted or grazed, ample rainfall in most areas, terrain suited for mechanization, an enlightened government program for agriculture, and an active demand in world markets for most farm crops raised.

Continued progress and expansion appear to require:

(a) New railroad lines to bring produce to ocean ports and urban consumption centers without excessive handling and portaging.
(b) New hard surfaced arterial and feeder highways.
(c) More general use of commercial fertilizers. This would probably mean construction of fertilizer factories within the Belgian Congo and Ruanda-Urundi.
(d) Continuation and expansion of mechanization on a gradual, realistic, down-to-earth basis.
(e) Continued successful operation of the Ten-Year Plans, which have as their avowed purpose the creation of a domestic market.
(f) Continuation and expansion of the paysannat program. Land cultivated under this program has shown great increases in yields over that achieved under traditional shifting cultivation.
(g) Continuation of the world-famous INEAC research and extension programs.
(h) Continuation and expansion of the agricultural research programs of IRSAC.
(i) More realistic and scientific management of livestock, along with continued reduction and control of the tsetse fly. With better management should come improvement in meat and dairy products processing and marketing.
(j) Political stability under the new Congolese Government. The Belgian administrators have followed a strictly paternalistic program of improving the economic and social conditions of the Africans, while giving them few political rights. Africans and European residents have had no vote at all until quite recently, when they were permitted to vote for municipal officials in a few cities.

In a sense, the paternalistic betterment programs in operation in the Belgian Congo and Ruanda-Urundi have been superimposed on the indigenous traditions and customs and have not been the outgrowth of any spontaneous feeling on the part of the African population.

Consumption.

Population Growth.--The predominant African population will probably increase at an annual rate of 1½ to 2 percent or more, depending on the reduction or extermination of the tropical diseases which plague large parts of the area. On the other hand, industrialization, rises in the level of living, and employment of women in business and industry will likely be factors working toward a decrease in the birth rate. Emigration and immigration are not likely to

to have much effect on the size of the African population.

The size of the European population is much less predictable. Under the new Congolese Government it is possible that the size of the European population will stabilize or even decrease as Belgians and other Europeans return to their homelands.

Industrialization.--The eastern portions of the Belgian Congo, as well as Ruanda-Urundi, are producers of a variety of minerals, including copper, industrial diamonds, cobalt, uranium, and tin.

Katanga Province, rich in copper mines, and with smelters at Elisabethville and Jadotville, may already be classified as industrial.

In time, Leopoldville Province will undoubtedly be highly industrialized, but for an entirely different reason. The proposed Inga hydroelectric project on the Congo River below the city of Leopoldville could produce electricity equal to the total now being used in all of Western Europe. Its full development would give the Belgian Congo--and especially Leopoldville Province--the prospect of becoming one of Africa's most highly industrialized countries, with an increasing demand for imported food plus the wages to pay for it.

Level of Living.

The level of living in the Belgian Congo and Ruanda-Urundi varies widely. Most of the African farm families live outside the commercial economy; thus cash incomes are extremely small but there are few things they want to buy. Those Africans who have moved up to white-collar and industrial jobs have wider wants and needs and the money to satify them. Europeans generally are paid the very high salaries required to maintain in the tropics a standard comparable to that of well paid persons in the United States or Western Europe.

Under the agricultural development programs of the last decade or so, the productivity of African farmers has begun to increase. With continued emphasis on such programs, and with increased industrialization and urbanization, the level of living of the African people is bound to increse more rapidly than in the past.

U. S. Prospects for Trade.

The United States already supplies a fairly good share of the Congo's agricultural imports--about a fifth. With alert salesmanship and care as to quality, it appears that the United States will hold and increase its share. Aside from the mother country, Belgium, no foreign supplier is given preferential treatment. There are no preferential tariffs, no foreign exchange restrictions, and no quantitative license requirements.

Exports of coffee, palm kernel oil, rubber, palm oil, other agricultural products, and minerals to the United States will probably increase in the years ahead. However, on a short-term basis, it is possible that these exports will decrease, owing to adjustments incident to the attainment of political independence. These exports will bring in abundant dollars for purchase of U. S. goods of all kinds.

Belgian Congo, Secrétariat Général, Section Statistique.
Bulletin Mensuel du Commerce Extérieur du Congo Belge et du Ruanda-Urundi. Leopoldville, December issues, 1956-58.

Belgium, Ministère des Colonies.
Plan Décennal pour le Développement Economique et Social du Congo Belge. Brussels, 1949.

———
Plan Décennal pour le Développement Economique et Social du Ruanda-Urundi. Brussels, 1951.

——— Direction de l'Agriculture, des Forêts et de l'Elevage.
"Agriculture Congolaise." Bulletin Agricole du Congo Belge, vol. 45, No. 4, August 1954.

——— Direction de l'Agriculture, des Forêts et de l'Elevage.
"Les Paysannats Indigènes du Congo Belge et du Ruanda-Urundi," by P. Staner. Bulletin Agricole du Congo Belge, vol. 46, No. 3, June 1955.

——— Direction de l'Agriculture, des Forêts et de l'Elevage.
"Statistiques 1957 et 1958 du Congo Belge et du Ruanda-Urundi; Agriculture, forêt, élevages, pêche et pisciculture." Bulletin Agricole du Congo Belge, vol. 50, No. 4, August 1959.

——— Direction des Etudes Economiques.
La Situation Economique du Congo Belge et du Ruanda-Urundi en 1957, 1958. Brussels, 1958, 1959.

Dunn, Read P., Jr.
Cotton in Africa. National Cotton Council, Memphis, 1950.

Hailey, Lord.
An African Survey. Oxford University Press, London, rev. ed., 1957.

Hathcock, James S.
A Study of Agricultural Conditions in the Belgian Congo and Ruanda-Urundi. Office of U. S. Special Representative in Europe, Food and Agriculture Division, Paris, 1952.

Joshi, N. R., McLaughlin, E. A., and Phillips, Ralph W.
Types and Breeds of African Cattle. United Nations, Food and Agriculture Organization, Rome, 1957.

Société Commerciale Anversoise et Société Belge d'Extrême-Orient Réunies.
Main Belgian Congo and Ruanda-Urundi Agricultural Products, Annual Review, 1957. Antwerp, 1958.

United Nations.
Special Study on Economic Conditions in Non-Self-Governing Territories. ST/TRI/SER. A/13, New York, 1958.

U. S. Bureau of Foreign Commerce.
Basic Data on the Economy of Belgian Congo and Ruanda-Urundi. Washington, 1958.

U. S. Department of State.
Unclassified despatches from the American Consulate General, Leopoldville, Belgian Congo, and the American Consulate, Elisabethville, Belgian Congo, 1956-59.

U. S. Foreign Agricultural Service.
Foreign Crops and Markets, World Summaries, Crops and Livestock, various monthly issues, Washington, 1958 and 1959.

Unclassified agricultural reports from the Agricultural Officer, American Consulate General, Leopoldville, Belgian Congo, 1956-59.

Van den Abeele, Marcel, and Vandenput, René.
Les Principales Cultures du Congo Belge. 3d ed. Ministère des Colonies, Direction de l'Agriculture, des Forêts et de l'Elevage, Brussels, 1956.